PROBLEMS FOR SOLUTION.

ALGEBRA.

284. Proposed by DR. E. H. MOORE, The University of Chicago, Chicago, Ill.

Discuss the system of equations:

$$\begin{cases} x^k+y^k=a_k \\ x^l+y^l=a_l \end{cases} \quad (k,\ l \text{ distinct positive integers})$$

in general and for particular values of $(k,\ l;\ a_k,\ a_l)$.

285. Proposed by DR. E. H. MOORE, The University of Chicago, Chicago, Ill.

Discuss the system of equations:

$$\begin{cases} x^k+y^k+z^k=a_k \\ x^l+y^l+z^l=a_l \\ x^m+y^m+z^m=a_m \end{cases} \quad (k,\ l,\ m \text{ distinct positive integers})$$

in general and for particular values of $(k,\ l,\ m;\ a_k,\ a_l,\ a_m)$.

286. Proposed by DR. E. H. MOORE, The University of Chicago, Chicago, Ill.

Discuss the system of n equations in $x_1,\ x_2,\ \dots,\ x_n$:

$$\begin{array}{l} x_1^{k_1}+x_2^{k_1}+\dots+x_n^{k_1}=a_1 \\ x_1^{k_2}+x_2^{k_2}+\dots+x_n^{k_2}=a_2 \\ \vdots \qquad \vdots \qquad\quad \vdots \qquad \vdots \\ x_1^{k_n}+x_2^{k_n}+\dots+x_n^{k_n}=a_n \end{array}$$

where the $k_1,\ \dots,\ k_n$ are n distinct positive integers, and the $a_1,\ \dots,\ a_n$ are n given numbers.

GEOMETRY.

317. Proposed by J. STEWART GIBSON, Department of Physics, Wadleigh High School, New York City.

Find the locus of the vertices of the parabolas described by particles thrown off a uniformly revolving circumference.

318. Proposed by G. W. GREENWOOD, M. A., Roanoke College, Salem, Va.

Is it possible by a straight edge and sect carrier, *i. e.*, without the use of a circle, to construct a mean proportional to two given sects?

CALCULUS.

240. Proposed by L. MORDELL, Philadelphia, Pa.

Show that the osculating conic of the catenary $y=c\cosh\frac{x}{c}$ at the point for which $y=\frac{c\sqrt{10}}{2}$ is a parabola.

241. Proposed by C. N. SCHMALL, 89 Columbia Street, New York City.

Differentiate $y=1+\cfrac{x}{1+\cfrac{x}{1+\cfrac{x}{1+\cfrac{x}{1+\text{etc.}}}}}$